STUDIES IN PANAMA CULICOIDES (DIPTERA, HELEIDAE) IV. DESCRIPTION OF THREE NEW SPECIES

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This paper is based on material collected by the junior author in Panama by means of light traps. The methods and terminology are explained briefly in Part I of this series (1953, Jour. Wash. Acad. Sci. 43: 69–77). The types of the three new species here described and most of the other material studied, are deposited in the U. S. National Museum, Washington, D. C.

Culicoides carsiomelas n. sp.

(Figure 1)

Female. Length about 0.9 mm., wing 0.95 by 0.44 mm.

Head, including antennae and palpi, dark brown; eyes narrowly separated, bare. Antenna with flagellar segments in proportion of 18: 16: 16: 16: 16: 16: 16: 16: 22: 22: 26: 24: 35, antennal ratio thus 1.0; distal sensory tufts on segments III, VII-X. Palpal segments in proportion of 5: 15: 25: 8: 8, third segment (fig. 1b) broadly swollen with very deep, large sensory pit.

Mesonotum without prominent pattern, the sides and entire anterior margin back to sensory pits dark brown; median area from sensory pits to prescutellar depression and wing bases brownish yellow. Scutellum yellowish, brown in middle on anterior margin. Postscutellum and pleuron brownish black. Legs brown, fore- and mid femora with subapical, all tibiae with sub-basal and hind tibia with apical, narrow pale rings; apical comb of hind tibia with four spines, the ventral one longest.

Wing (fig. 1a) with first radial cell slitlike, second radial cell complete, twice as long as broad; costa extending to 0.65 of wing length; macrotrichia sparse but covering distal half of wing and anal cell to near its base. Wing appearing mostly pale with limited dark areas; anterior wing margin with two broad yellow areas, the first at wing base extending entirely across anal cell, the second centered on r-m crossvein, which however, is itself entirely black-

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ened; two other very dark broad anterior spots, the first midway between crossvein and wing base, the second extending over second radial cell and distal half of first; cell R_5 with a small, round, pale spot on anterior margin just past end of costa, a separate, U-shaped, pale spot lying behind this spot and enclosing within its arms a small black spot behind end of second radial cell; apex of cell R_5 with a large, distally notched, round pale spot nearly filling cell, but more or less broadly attaining anterior wing margin and broadly separated from distal wing margin; cell M_1 with two elongate narrow pale spots nearly filling cell but the second broadly separated from wing margin; cell M_2 with pale streak extending from wing base to level of mediocubital fork, an oval pale spot lying close to vein M_2 behind the basal pale spot in cell M_1 and a round pale spot near apex of cell but broadly separated from wing margin; cell M_4 with a large round pale spot slightly anterior to middle of cell; a single large pale spot in apex of anal cell; apices of veins M_1, M_2, M_{3+4} and Cu_1 with small pale spots at wing margin. Halter knob infuscated, stem pale yellowish.

Abdomen dull blackish, cerci yellow. Spermathecae (fig. 1c) two, large, slightly unequal, one subspherical, the other pyriform with base of duct sclerotized a short distance.

Male genitalia (fig. 1d, e). Ninth sternum narrow, the ventral membrane bare; ninth tergum broad and not markedly tapering distally, the apicolateral processes short and narrowly pointed. Basistyle simple, ventral root foot-shaped, dorsal root long and slender; dististyle slender with narrow, curved apex. Aedeagus with basal arch reaching to three-fourths of total length, the basal arms rather stout, the distal apex truncated. Parameres each with base and stem curved, arcuate; apex of stem portion with a well-developed pouch, apical portion abruptly bent laterad, ventrad, and then mesad, bearing about four fine lateral barbs on the slender, pointed distal portion.

Holotype female, Mojinga Swamp, Canal Zone, 17 December 1951, F. S. Blanton, in light trap (Type No. 62806, U.S.N.M.). Allotype, same data except 29 October 1951; Paratypes: 6 females, same data but 28 August, 4, 14, November and 19 December 1951, July, August 1952; 1 female, San Lorenzo, Canal Zone, 15 August 1952; 2 females, El Real, Darién Prov., 8 August 1952; 8 females, Almirante, Bocas del Toro Prov., December 1952, January 1953.

C. carsiomelas is very closely related to *acotylus* Lutz, but in *acotylus* the distal pale spot in cell R_5 is well separated from the anterior wing margin, there is a separate small pale spot at the base of cell R_5 just ahead of vein M_1, the pale spot behind the base of

vein M_2 is absent, there are two distal pale spots in the anal cell, the scutellum is entirely dark brown and the sensory pit is lacking on the third palpal segment.

Culicoides fairchildi n. sp.
(Figure 2)

Female. Length about 0.85 mm., wing 0.85 by 0.38 mm.

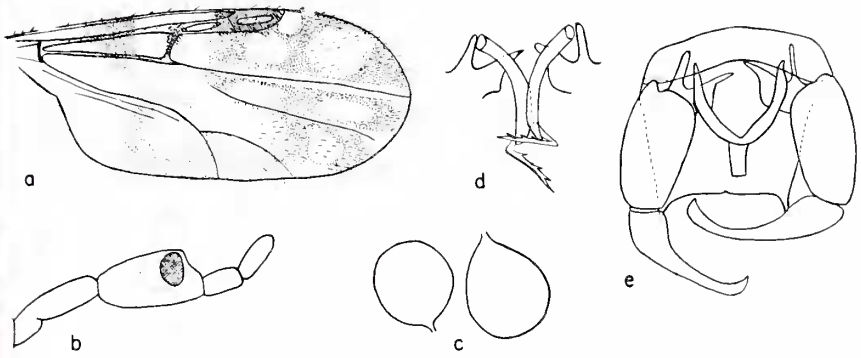
Head dark brown; eyes narrowly separated, bare. Antenna with flagellar segments in proportion of 18: 16: 16: 16: 16: 16: 16: 16:-25: 25: 25: 25: 48, antennal ratio thus 1.1; distal sensory tufts on segments III, VII and X. Palpal segments (fig. 2b) in proportion of 10: 10: 20: 10: 10, third segment swollen, with very broad, shallow, sensory pit on distal third.

Mesonotum dark brown on anterior half with prominent pattern of yellowish patches consisting of an admedian pair of large elongate spots, just laterad of which is another pair of very small round spots; humeri, a small area around each sensory pit, and entire posterior half of mesonotum yellowish; scutellum dark brown in center and yellowish on sides; postscutellum dark brown; pleuron yellow on upper half and dark brown below. Legs dark brown; knee spots blackish; fore and mid femora yellow on distal halves, fore and mid tibiae yellow on basal halves, hind tibia with narrow basal and apical pale rings; four distal tarsal segments pale.

Wing (fig. 2a) with radial cells both complete, short; costa extending to 0.6 of wing length; macrotrichia sparse in apex of cells R_5, M_1 and M_2. Yellowish spots along anterior margin of wing at wing base and over r-m crossvein, the latter spot scarcely attaining anterior media caudad; very dark areas between these two spots and over second radial cell and most of first. Cell R_5 with an irregular pale spot just past end of costa extending basad behind vein R_{4+5}; a subapical round pale spot in middle of cell R_5; elongate pale spots, sometimes faint, straddling veins M_1 and M_2 at about their midlengths; one distal oval pale spot not reaching wing margin in cell M_1 past the spot straddling M_1; cell M_2 with a large round pale spot just anterior to the junction of mediocubital fork and a distal pale spot broadly reaching margin of wing; cell M_4 with a large distal round spot at wing margin; anal cell with two distal pale spots, entire base of cell pale. Halter pale yellow.

Explanation of Plate III

Fig. 1. *Culicoides carsiomelas;* Fig. 2. *Culicoides fairchildi;* Fig. 3. *Culicoides pusilloides:* a, female wing; b, female palpus; c, spermatheca; d, male parameres; e, male genitalia, parameres omitted.



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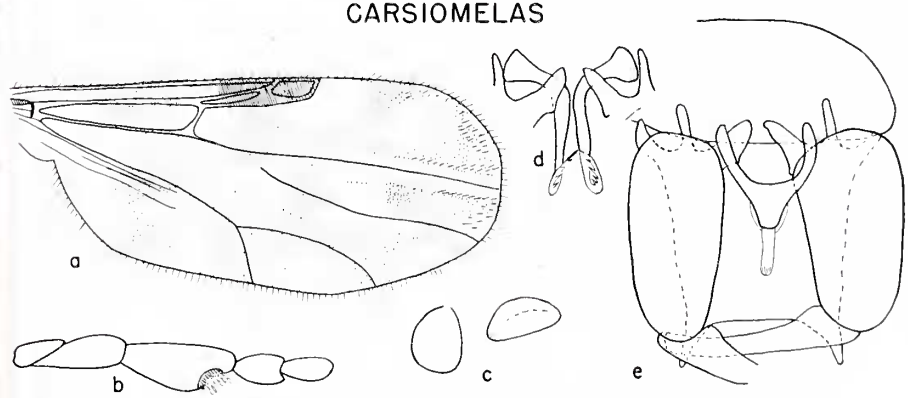

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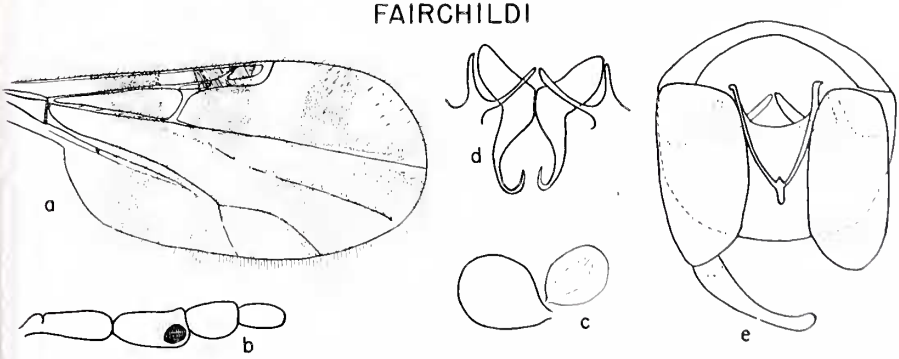

PUSILLOIDES

Abdomen black, velvety on sides, grayish pruinose above. Spermathecae two, subequal, pyriform, without sclerotized necks.

Male genitalia (fig. 2d, e): Ninth sternum with posterior margin not excavated, the posterior membrane bare; ninth tergum slightly tapering to slender, well-developed, apicolateral processes. Basistyle with ventral root rather slender, with a small posterior spur, dorsad root slender; dististyle long and slender, slightly curved, with slender, rounded, slightly bent apex. Aedeagus with broad basal arch, arms meeting at approximately half the total length of aedeagus; distal portion slender with bluntly rounded apex. Paramere with base knobbed, stem fairly straight and tapering, apical portion abruptly bent, the base of fringe moderately expanded with approximately five basal and two apical barbs.

Holotype female, allotype, Madden Dam, Canal Zone, 28 April 1952, F. S. Blanton, in light trap (Type No. 62801, U.S.N.M.). Paratypes: Canal Zone—6 females, Madden Dam, 28 April, 21 September, 9 October, 1952; 1 male, 3 females, Mojinga Swamp, 1 November 1951, January 1953; 3 females, San Lorenzo, 15 August 1952; Darien Prov.—6 females, El Real, 19 July, 8 August 1953; 1 female. Colon Prov.—Cativa, 27 August 1952; Bocas del Toro Prov.—8 females, Almirante, October, November, December 1952.

We take great pleasure in naming this species in honor of Dr. Graham Bell Fairchild of the Gorgas Memorial Laboratory, in recognition of his extensive contributions to the knowledge of Neotropical Diptera.

C. fairchildi belongs in the *haematopotus* group of the subgenus *Occacta* Poey. The wing markings, with pale spots straddling veins M_1 and M_2, would put this species in the *copiosus* group, but the male genitalia of the latter group are of an entirely different type. The male genitalia of *fairchildi* are very similar to those of *carpenteri* Wirth and Blanton, *galindoi* Wirth and Blanton and *pifanoi* Ortiz. In all of the latter species, however, the pale spots straddling veins M_1 and M_2 are absent or are not discrete, and the distal pale spot in cell R_5 meets the wing margin broadly.

Culicoides pusilloides n. sp.
(Figure 3)

Female. Length about 0.75 mm., wing 0.75 by 0.35 mm.

Head dark brown, antennal flagellum and palpus yellowish. Eyes broadly contiguous above, bare. Antenna with flagellar segments in proportion of 12:10:10:10:10:10:10:13:15:16:18:-18:26, antennal ratio thus 1.1; distal sensory tufts on segments

III, XII-XV. Palpal segments (fig. 3b) in proportion of 5:12:-15:8:7, third segment slightly swollen with a small, deep sensory pit.

Mesonotum blackish; anterior margin and two broad sublateral vittae extending the entire length of mesonotum, intense black; a broad median band and sides of mesonotum behind level of humeral pits densely bluish gray pruinose. Scutellum, postscutellum and pleura black. Legs brown; fore and mid femora with broad apical pale rings; fore tibia with narrow, and mid tibia with broad basal pale rings; hind tibia and most of tarsi yellowish. Hind tibia with six spines on apical comb, the ventral one much longer than the others.

Wing with costa extending 0.56 way to wing tip; radial cells complete and short; wing nearly bare, only a few macrotrichia along wing margin in cells R_5 and M_1. Wing with four incomplete transverse bands of large, diffuse pale spots as in figure 3a. Base of wing yellow, this pale area continuing as a pale streak to distal fourth of cell M_2 and including all of anal cell except one dark spot over middle of anal vein. Second pale area reaching from costal margin over r-m crossvein, extending into pale area in base of cell M_2. Third pale area including distal half of second radial cell, broadly crossing vein M_1 and continuing across cells M_1 and M_2 to wing margin in cell M_4, with a narrow extension to wing margin in cell M_1. Fourth pale area including the broad apex of cell R_5 to wing margin. Dark areas of wings thus less extensive than the pale areas, the dark band in cell R_5 less than half as broad as the pale areas on each side; vein M_1 dark-margined on distal half; vein M_2 with a strong subapical dark spot, the extreme apex pale; veins M_{3+4} and Cu_1 dark-bordered and base of cell M_4 dark. Halter pale yellowish.

Abdomen pale brown, darker toward apex. Spermathecae two, subspherical, very unequal, their diameters in the proportion of 11 to 18, the entrances to the ducts not sclerotized.

Male. Similar to the female with the usual sexual differences; abdomen pale yellowish. Genitalia (fig. 3d, e) with ninth sternum narrow, ribbonlike, the ventral membrane not spiculate; ninth tergum broader than long, slightly convex caudally, without apicolateral processes or median notch or lobes. Basistyle about twice as long as broad, not tapering, ventral root long and slender, dorsal root about half as long as ventral one, pointed; dististyle curved, the apex slightly expanded, with a distinct point on mesal apex. Aedeagus 1.4 times as long as basal breadth, with basal arch reaching about 0.4 of total length, distal apex nipplelike. Parameres with

bases very stout; stems bulbous; apices very slender and recurved, without fine hairs.

Holotype female, allotype, Almirante, Bocas del Toro Province, Panama, November 1952, F. S. Blanton, in light trap (Type No. 62808, U.S.N.M.). Paratypes: 9 males, 58 females, same data as type; 7 males, 23 females, same data except October 1952; 1 male, 8 females, January 1953; Canal Zone—1 male, 3 females, Mojinga Swamp, 24 October 1951, 7 May 1952; 1 female, Loma Boracho, 23 February 1951; 3 males, Camaron, Ft. Kobbe, 23 June 1952; 1 female, Pedregal, Panama Prov., 3 December 1952.

This species belongs to the *obsoletus* group of species, which in the Neotropical Region is also represented by *pusillus* Lutz. The latter species differs from *pusilloides* in having the second radial cell entirely dark, or the yellow area distal to it only slightly encroaching on the end of vein R_{4+5}; the wing pattern very faint and obscure; the legs entirely pale except for the dark knee spots; eyes narrowly contiguous, the antennal ratio 1.2; antenna with sensoria on segments III, XIII-XV; palpal segments not so stout, the pit on the third segment faint or absent; hind tibial comb with five spines; spermathecae oval and subequal; male genitalia with ninth tergite bilobate and mesally cleft and the parameres with slender bases. The Holarctic species *obsoletus* (Meigen) and *chiopterus* (Meigen) and the Palaearctic *scoticus* Downes and Kettle and *pseudochiopterus* Downes and Kettle all are larger species (wing 1.15–1.58 mm. long) and are easily separated from *pusillus* and *pusilloides* and from each other by characters of the male genitalia (figured by Downes and Kettle, 1952, Proc. Roy. Ent. Soc. London (B) 21: 61–78).

A NEW SPECIES OF VELOIDEA FROM VENEZUELA (HEMIPTERA: VELIIDAE).

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The present paper characterizes an undescribed species of the genus *Veloidea* Gould from Venezuela and also describes the male form of *Oiovelia cunucunumana* Drake and Capriles from Paraguay. In addition to the new species described herein, the genus *Veloidea* is represented by *V. gigantea* Gould (genotype) from Colombia and by *V. vivata* (Buchanan-White) (= *Velia vivida* Buchanan-

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